UNITED STATES DEPARTMENT OF AGRICULTURE
WEATHER BUREAU
Washington

Office of the Chief December 1, 1931.

CIRCULAR

CHANGE FROM "SURFACE" TO "SEA LEVEL" AS A BASE FOR WIND ALOFT REPORTS

I AMENDMENTS TO THE AEROLOGICAL CODE OF 1930.

II INSTRUCTIONS FOR REPORTING ALONG THE AIRWAYS.

III ROUTE FORECASTS.

After the surface wind word in the code, a word is entered to designate the next standard level for which wind data are available. This word will be a number of from one to seven taken from Table 1, and its value will depend upon the elevation of the station above sea level. The second standard level to be coded must be more than 200 meters above the surface elevation, otherwise the next succeeding level will be used instead. For example: if the station elevation is 810 meters data will be coded for the surface, 1500, 2000 meters, etc., while if the station elevation is 795 meters data will be coded for the surface, 1000, 1500, 2000 meters, etc.

To the heading of section X add the words "above sea level".

Pages 4 & 5, paragraph 43 - Substitute the following for the examples given:

(a) Where all standard levels are included and station elevation is 245 meters:

(Station)	(Time)	(Surface)	(Map No.)	(500)	(1000)	(1500)	(2000)	(2500)
Cleveland	Carbuncle (6am, 10th)	Biped (NNE-4)	One	Deadlock (NE-8)	Diplomacy (ENE-9)	Bogbull (NNE-10)	Bibulous (NNE-10)	Select (NW-4)

(3000)	(4000)	(Max. Alt.)	(Wind at Max. Alt.)	(Clouds)	(Clouds)	(Visibility)
Nimbose (WSW-18)	Nobody (WSW-19)	Tugemsy (4500)	Nimbose (WSW-18)	Cubby (1 Ci.N)	Ciddy (1Cu.NE)	Seven ($6\frac{1}{4}$ to $12\frac{1}{2}$ mi.)

(b) Where a rapid change occurred in wind direction and velocity between the surface and 400 m:

(Station)	(Time)	(Surface)	(Max. Alt.)	(Wind at Max. Alt.)	(Clouds)	(Cloud Alt.)	(Visibility)
Washington	Cider (Mid.24-25)	Biped (NNE-4)	Turtle (400)	Nancy (SW-1)	Chignon (9 St.SW)	Turtle (400)	Three (550 to 1100 yds.)

(c) Where two kinds of clouds are observed and their altitudes determined; one type moving rapidly; also a thunderstorm. Station elevation 1294 meters.

(Station)	(Time)	(Surface)	(Map No.)	(1500)	(2000)	(2500)	(3000)	(4000)	(Max. Alt.)
El Paso	Hamburg (6pm.10th)	Biped (NNE-4)	Three	Bogbull (NNE-10)	Bibulous (NNE-10)	Select (NW-4)	Nimbose (WSW-18)	Nobody (WSW-19)	Tuggum (4000)

(Clouds)	(Alt. of St Cu.)	(Clouds)	(Alt. A. St.)	(Visibility)	(Thunderstorm)
Combat (2St.Cu.N)	Tubery (1500)	Centrists (6 A.St.W) (Moving rapidly)	Tuggum (4,000)	Six ($2\frac{1}{2}$ to $6\frac{1}{4}$ mi.)	Warrant (West of Station)

(d) Where no observation is made due to low clouds; station elevation 444 meters:

(Station)	(Time)	(Reason)	(Word)	(Surface)	(Clouds)	(Cloud Alt.)	(Visibility)
Ellendale	Hipboy (Noon-19th)	Low Clouds (No observation)	None	Biped (NNE-4)	Chaldon (9St.NE)	Tucking (575 to 600 m.)	Four (1100 yds. to $1\frac{1}{4}$ mi.)

(e) Wind calm at surface and at two upper levels; station elevation 271 meters:

Station)	(Time)	(Surface)	(Map No.)	(500)	(1000)	(1500)	(2000)	(Max. Alt.)
Greensboro	Cabin (6am-16th)	All (Calm)	One	Boldly (NNE-1)	All (Calm)	Elk (Calm)	Dilatory (ENE-3)	Turdet (2400 m.)

(Wind at Max. Alt.)	(Clouds)	(Cloud Alt.)	(Visibility)
Fatback (E-12)	Cifax (3 Cu. E)	Turdet (2400 m.)	Six ($2\frac{1}{2}$ to $6\frac{1}{4}$ mi.)

(f) With the 1000-meter level missing, elevation of station 606 meters:

(Station)	(Time)	(Surface)	(Map No.)	(1000)	(Max. Alt.)	(Wind at Max. Alt.)	(Clouds)
Spokane	Ciffum	All	Two	Missing	Turbany	Diplomacy	Cifax
	(Mid.30-31)	(Calm)		(No data)	(1300 m)	(ENE-9)	(3 Cu. E)

(Cloud Alt.)	(Visibility)
Turbany	Seven
(1300 m.)	($6\frac{1}{4}$ to $12\frac{1}{2}$ mi.)

In Table 3, the headings should be changed as follows:

Class 1 words - Altitudes: Surface, 1000, 2000,3000.

Class 2 words - Altitudes: 500, 1500, 2500, 4000.

Form 1116-Aer. has been revised and a supply of the new forms will be furnished all pilot balloon stations. All the old forms on hand January 1, 1932, are to be mailed to the Central Office.

II Instructions For Reporting Winds Aloft In English Units Along The Airways.

Beginning January 1, 1932, wind aloft reports in English units (feet and miles per hour), transmitted along the airways by radio and teletype and furnished to Department of Commerce radio stations for broadcasting will be given in altitudes above sea level, instead of above surface, as has been the practice heretofore. This change is considered advisable and desirable to the end that a uniform system for reporting these data be established for the entire country, and that, since the reports are made in English units, a symmetrical and more closely related system of levels be in use. The lack of uniformity in these reports for the country as a whole has been conducive to confusion among those receiving and using them, to duplication of reports, and in cases where one-minute intervals are reported, to undue length in transmitting and broadcasting the data. The following plan, as outlined, will therefore be used, beginning with the date above indicated:

1. The reports will be designated as "Winds Aloft".

2. The reports will begin with the station designation, followed in order by the time (beginning of observation), the words "winds aloft", the abbreviation "elvtn" (elevation), the elevation of the station in hundreds or thousands of feet to the nearest hundred feet above sea level, and the abbreviation "SFC" (surface), followed by the surface wind direction and velocity. For example, using the authorized abbreviations:

WN (Washington) 1130 A ES WINDS ALOFT ELVTN ZERO SFC SW5.....

CX (Cheyenne) 6 P MS WINDS ALOFT ELVTN 61 HND SFC NS.....

3. The following levels will be reported insofar as available at each station, taking into account of course the station elevation above sea level and the altitude reached:

1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 10,000, 12,000, and 14,000 feet above sea level.

4. The wind direction and velocity at the maximum altitude will be reported, whenever the maximum altitude reached is 500 or more feet above a regularly reported level, up to and including the 12,000-ft. level. Above 14,000 feet the wind direction and velocity at the maximum altitude reached will be sent only if the maximum altitude exceeds the 14,000-ft. level by 2000 or more feet, or if a marked shift in wind direction or sudden change in velocity occurs above the last standard level reported. In all cases, 20,000 feet will be considered the extreme maximum altitude to be reported.

5. The wind direction and velocity at the maximum altitude reached will be reported , whenever a marked shift in the wind direction or sudden change in velocity is observed above the highest reported standard level, even though the difference in elevation is less than 500 feet for levels below 14,000 feet and less than 2000 feet for levels above 14,000 feet.

6. The first standard level to be reported by any station must be 500 or more feet above the sea-level elevation of the station to the

nearest hundred feet. For example; if the elevation of a station above sea level is 1520 (reported as 1500) feet the first level above "surface" to be reported would be that for 2000 feet, but if the station elevation is 1560 (reported as 1600) feet, the first level reported above "surface" would be that for 3000 feet.

7. Levels will be designated in the reports by numerals only. These will indicate the number of thousands of feet for the particular levels, i.e., "1" for 1000, "2" for 2000, "14" for 14,000, etc. Maximum altitudes will be specifically designated in hundreds of feet up to 10,000 feet, and in thousands, or thousands and hundreds, of feet thereafter to 20,000 feet, i.e., a maximum altitude of seventy six hundred feet would be reported as "76 HND"; one of ten thousand seven hundred feet as "10 THSD 7 HND"; one of thirteen thousand feet as "13 THSD"; etc.

8. The word "END" will immediately follow the last reported level.

9. Abbreviations (in addition to those for wind directions and station designations) are to be used as follows:

(a). ELVTN ELEVATION

(b). SFC SURFACE

10. Examples of reports follow:

(a). Cheyenne, Wyoming; actual elevation 6145 feet.

CX 430 A MS WINDS ALOFT ELVTN 61HND SFC SW6 7SW12 8W14 10W32 12WNW35 12THSD 8HND WNW40 END.

(b). Washington, D. C.; actual elevation 33 feet.

WA 630 P ES WINDS ALOFT ELVTN ZERO SFC W7 1W11 2W15 3WNW15 4NW17 5NW18 6NW14 65HND NW11 END.

(c). Cleveland, Ohio; actual elevation 804 feet. (Example of report having marked wind direction change less than 500 feet above a standard level).

CV 1130 A ES WINDS ALOFT ELVTN 8HND SFC E3 2E8 3ESE4 4SE4 5S3 54HND NW10 END.

(d). North Platte, Nebr.; actual elevation 2789 feet. (Example of report where the maximum altitude reached is less than 2000 feet above the 14,000 ft. level, but where a marked change in wind velocity is observed at the maximum altitude);

NP 1030 A CS WINDS ALOFT ELVTN 28HND SFC SW7 4SW11 5WSW14 6WSW18 7SW15 8SW11 10SW8 12W10 14W25 15THSD 2HND WNW50 END.

(e). Albuquerque, N. Mex.; actual elevation 5013 feet.
AB 930 A MS WINDS ALOFT ELVTN 5THSD SFC N8 6N10 7NNE14 8NE9 10N6 12NW9 14NW14 17THSD 6HND WNW20 END.

11. Disregarding cases where the data are telegraphed or telephoned, the foregoing system is to be used in all cases where wind aloft reports are sent along the airways by radio and teletype for direct use at stations on the airways. Relays of English-unit reports from one teletype circuit to another will be governed by the same procedure as is now authorized. Coded reports are not to be placed on the radio and teletype circuits for use on the airways themselves, as this would constitute a duplication where the English-unit reports are also sent, but may, of course, be forwarded to Forecast Centers as now authorized, provided they are in proper message form with address and signature. Department of Commerce officials will monitor the teletype circuits in accordance with the foregoing.

It is realized that the system outlined will require that two sets of data be taken from either Form 1110A-Aer. or Form 1115-Aer. in the cases where observations are sent both along the airways in English units and to the Forecast Centers in code. In this connection, however, it may be stated that Form 1115-Aer. is being revised in such a manner as to provide an expeditious method for taking off both sets of data, and the revised Form will be available to stations if not by January 1st at least very shortly thereafter.

It is believed that the advantages of using levels in even thousands of feet on a sea-level basis along the airways are obvious and far outweigh the small amount of additional work involved.

A standard method for displaying wind aloft information at airport stations is now being developed at the Central Office and information concerning this will be forwarded to all stations as soon as practicable.

III. ROUTE FORECASTS OF WINDS ALOFT

Route forecasts issued by the district forecasters at San Francisco and Denver will be on the basis of elevations above sea level. Those issued by the district forecasters at Chicago, New Orleans and Washington will be on the basis of elevations above surface. It is necessary that employees issuing information predicated on route forecasts keep these facts clearly in mind.

C. F. Marvin,
Chief of Bureau.